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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,473	02/05/2004	Yoshio Suzuki	450100-03198.1	7053

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FROMMER LAWRENCE & HAUG, LLP.
10TH FLOOR
745 FIFTH AVENUE
NEW YORK, NY 10151

EXAMINER	
CHUNG, DAVID Y	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/773,473	SUZUKI ET AL.	
	Examiner	Art Unit	
	David Y. Chung	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 13-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 13-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/870,327.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *Feb. 5, 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5-11 and 13-15 rejected under 35 U.S.C. 103(a) as being unpatentable over Mazaki et al. (U.S. 6,124,913) in further view of Tsujikawa et al. (U.S. 6,320,628) and Omae et al. (U.S. 5,570,215).

As to claims 1, 5, 10 and 14, Mazaki et al. discloses an OCB mode liquid crystal display having one or two compensators formed between the upper electrode substrate 3 and analyzer 10 on the light exit side of the display. Figures 10 and 16 show adjacent compensators 7 and 9 while figure 18 shows a single compensator 7. Figures 4(h) – 4(k) show various compensator arrangements for the liquid crystal displays of figures 10 and 16, including those in which the optical phase difference caused by light entry side liquid crystal molecules is compensated by one of the two compensators and the optical phase difference caused by light exit side liquid crystal molecules is compensated by the other compensator. Figures 4(a) – 4(c) show various compensator arrangements for the liquid crystal display of figure 18.

Mazaki et al. does not disclose a microlens array for focusing incoming light onto the display pixels. Tsujikawa et al. teaches that combining a microlens array with a liquid crystal device in a projection display allows portions of blue, red, and green luminous fluxes to be selectively incident to the pixels of the LCD element, thereby eliminating the need for color filters and increasing the optical utilization efficiency of light. See column 3, lines 25-35. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the device of Mazaki et al. with a microlens array in order to create a projection display with better light efficiency as taught by Tsujikawa et al.

Mazaki et al. does not disclose selecting the rotational angle of the compensator to provide the best contrast. Omae et al. discloses rotating phase difference plate 113 in figure 3 in order to adjust contrast to its best. Omae et al. teaches that in many cases, the contrast adjustment can be effected only by this rotation. See column 11, line 61 – column 12, line 15. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to adjust contrast by selecting the rotational angle of the compensator because in many cases, selecting this rotational angle is sufficient to satisfactorily adjust contrast.

As to claims 6-9, Mazaki et al. discloses an OCB mode liquid crystal display having two adjacent compensators 7 and 9 formed between the upper electrode substrate 3 and analyzer 10 on the light exit side of the display. See figures 10 and 16. Figures 4(h) – 4(k) show various compensator arrangements for the liquid crystal

displays of figures 10 and 16, including those in which the optical phase difference caused by light entry side liquid crystal molecules is compensated by one of the two compensators and the optical phase difference caused by light exit side liquid crystal molecules is compensated by the other compensator.

Mazaki et al. does not disclose a method of improving contrast. However, it was well known and obvious to perform computer simulations in order to find optimal values for the result effective variables of a liquid crystal device. These steps were necessary to optimize the performance of the device and were typically performed as part of the post manufacturing process. In the display of Mazaki et al., it would have been obvious to one of ordinary skill in the art at the time of invention to find appropriate values for the retardation and inclination angle of the compensators in order to optimize the contrast and viewing angle of the display.

As to claims 11 and 13, note the bend mode alignment shown in figures 10 and 16 of Mazaki et al. In the voltage applied state, the molecules are realigned such that the major axes change in position from one that is parallel to the substrates to a position perpendicular to the substrates as they are situated further from the light entry and light exit regions of the liquid crystal layer.

As to claim 15, note the crossed Nicols relationship of polarizer 5 and analyzer 1 in figures 10 and 16 of Mazaki et al.

Claims 2-4 rejected under 35 U.S.C. 103(a) as being unpatentable over Mazaki et al. (U.S. 6,124,913) in further view of Tsujikawa et al. (U.S. 6,320,628), Omae et al. (U.S. 5,570,215), and Gunning et al. (EP 0622656).

Mazaki et al. does not disclose forming the optical compensation film at an angle to the surface of the liquid crystal panel. Gunning et al. disclose various arrangements in figures 6-8 including one with the compensators disposed at an angle to the liquid crystal layer. Gunning et al. teaches that this arrangement, depicted in figure 8, allows the optical axis of the compensator layers to be substantially parallel to the average direction of the optical axis within the central, nominally homeotropic region of the liquid crystal layer in its driven state. An improvement in contrast is possible, allowing the display to be inverted, thereby benefiting from the inherently better grayscale performance in the lower quadrant of the display. See column 11, lines 10-35. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to tilt the compensators at an angle in order to improve contrast and grayscale performance.

Response to Arguments

Applicant's arguments filed February 5, 2004 have been fully considered but they are not persuasive. Mazaki et al. discloses an embodiment having a single compensator on the light exit side of the liquid crystal cell in figure 18. Compensators 7 and 9 in figures 10 and 16 are considered to be adjacent since there is no substantially

light modulating element between them. Applicant appears to have argued against the references of Mazaki et al., Tsujikawa et al., and Omae et al. without accounting for what their combined teaching would have suggested to one of ordinary skill in the art. In response to applicant's argument that the phase difference plate of Omae et al. is not a compensator, it is respectfully noted that the two terms ("compensator" and "phase difference plate") are used interchangeably within the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Chung whose telephone number is (571) 272-2288. The examiner can normally be reached on Monday-Friday from 8:30 am to 5:00 pm.

KENNETH PARKER
PRIMARY EXAMINER

David Chung
GAU 2871
05/31/04